

ORIGINAL

BEFORE THE
Federal Communications Commission
WASHINGTON, DC 20554

In the Matter of)

PRIMECo PERSONAL COMMUNICATIONS, L.P.,) CC Docket No. 94-102
DALLAS MTA, L.P., HOUSTON MTA, L.P. and) RM-8143
SAN ANTONIO MTA, L.P.)

Petition for Waiver of Section 20.18(c) of the)
Commission's Rules for Digital Wireless Systems)

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OFFICE OF THE SECRETARY

To: Chief, Wireless Telecommunications Bureau

**PETITION FOR WAIVER OF SECTION 20.18(c)
OF THE COMMISSION'S RULES**

PRIMECo PERSONAL COMMUNICATIONS, L.P.

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Table of Contents

	Page
SUMMARY	i
I. INTRODUCTION/BACKGROUND	2
A. From the Outset of the E-911 Proceeding There has Been Considerable Uncertainty As to the Scope of Carriers' TTY Obligations and Whether TTY Is Compatible With Wireless Digital Technologies	4
B. The Commission Did Not Mandate A Particular Digital Protocol and Promoted and Facilitated Rapid Digital Broadband PCS Deployment ..	7
1. The Commission Has Tacitly Encouraged and Expressly Facili- tated the Digitalization of Wireless Technologies While TTY Technologies Have Remained Unchanged	8
2. Broadband PCS Licenses Were Auctioned and Licensees Began Deploying Networks Before Digital TTY Solutions Were Feasible	9
C. No Manufacturer of Wireless Digital Handsets Currently Has A Commer- cially Available Product That Will Enable Carriers to Comply With Section 20.18(c)	10
II. WAIVER SHOWING	13
A. Steps to Provide Users of TTY Devices With the Capability to Operate Such Devices In Conjunction With Digital Wireless Phones	13
1. Problems with CDMA Generally	15
2. Voice-Based Solutions Are Currently Infeasible	16
3. Long-Term Data-Based Solutions	20
B. Tentative Timetables for Potential Solutions	23
C. Steps to Address "Consumer Concerns"	25
III. COMPLIANCE WITH SECTION 20.18(C) IS NOT CURRENTLY READILY ACHIEVABLE FOR DIGITAL CMRS PROVIDERS	28
IV. PRIMECO HAS SHOWN GOOD CAUSE FOR THE WAIVER	32
CONCLUSION	33

SUMMARY

PrimeCo is committed to implementing digital TTY capabilities in compliance with Section 20.18(c) and Section 255. However, it is currently neither technically feasible nor readily achievable to provide such capability by January 1, 1999. Further, it appears that a TTY solution will remain not readily achievable for at least some months thereafter. While industry has endeavored in good faith to develop digital TTY compatibility, solutions have remained elusive. In the meantime, carriers have met customer demand and buildout obligations by rapidly deploying their digital networks with available equipment and software. No vendor of digital wireless products to date has commercially available products such that compliance with Section 20.18(c) for CDMA networks is feasible or readily achievable.

Nevertheless, PrimeCo has taken steps to provide users of TTY devices with capability to operate such devices in conjunction with digital wireless phones. PrimeCo has formally inquired of its vendors the timing and feasibility of proposed solutions. PrimeCo itself has also internally evaluated various proposed solutions. While PrimeCo is testing a potential short-term proprietary solution, the short-term voice-based solutions before the Commission do not currently appear reliable and are neither feasible nor reasonably achievable. Further, while long-term data solutions hold promise, not all carriers have implemented wireless data capability. PrimeCo also reports that the receiver/repeater solution advocated by Lucent holds promise. Potential proposals are still evolving through the standards process.

PrimeCo meets the requirements for waiver of Section 20.18 and its request should be granted.

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OF THE COMMISSION'S RULES**

Pursuant to the Wireless Telecommunications Bureau's *Order* of November 13, 1998 and Section 1.3 of the Commission's rules, PrimeCo Personal Communications, L.P. ("PrimeCo"), for itself and the partnerships it controls,¹ hereby petitions the Bureau for waiver of Section 20.18(c) of the Commission's rules in regard to PrimeCo's digital system, effective January 1, 1999.² PrimeCo demonstrates herein its

¹ PrimeCo Personal Communications, L.P., is a broadband PCS licensee in the following MTAs: Chicago, Milwaukee, Richmond-Norfolk, New Orleans-Baton Rouge, Jacksonville, Tampa-St. Petersburg-Orlando, Miami and Honolulu. PrimeCo is the sole general partner and majority owner in the Dallas MTA, L.P., Houston MTA, L.P. and San Antonio MTA, L.P. (the "Texas Partnerships"), broadband PCS licensees in, respectively, the Dallas-Fort Worth, Houston and San Antonio MTAs. For ease of reference, references to "PrimeCo" throughout the instant petition include the Texas Partnerships.

² See 47 C.F.R. § 1.3; *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Order*, CC Docket No. 94-102, DA 98-2323, ¶¶ 11-12 (rel. November 13, 1998) ("*November 13 Order*").

“commitment to, and plans for, complying with Section 20.18(c)” of the rules such that grant of the requested waiver is warranted. PrimeCo also demonstrates herein (1) that there are fundamental technological barriers to carrying TTY calls over digital networks; (2) that providing such capability is not readily achievable pursuant to Section 255; and (3) that the availability of prospective solutions is ultimately a vendor-driven and dependent issue. As required, PrimeCo will supplement the instant Petition with additional responsive information that may become available, including information from vendors, every three months to indicate progress made toward implementation of TTY digital capability and to maintain the instant waiver.³

I. INTRODUCTION/BACKGROUND

PrimeCo is committed to implementing digital TTY capabilities in compliance with Section 20.18(c) and Section 255 of the Communications Act. As the Commission is aware, however, and as the record demonstrates, it is currently technically infeasible for digital wireless carriers, including PrimeCo, to comply with Section 20.18(c) by January 1, 1999. Furthermore, while there are promising recent developments which may facilitate a voice-based solution, it does not appear that a technical solution for compliance will be commercially available for some months. TTY devices generate tones (called “Baudot tones”) whenever a key is depressed on the TTY device. These tones are transmitted over the PSTN and delivered to a receiver which, in turn, converts the tones into alphanumeric characters. Access to PrimeCo’s network is through

³ *November 13 Order* ¶ 11.

digital devices manufactured by third party vendors, according to standards developed by standards bodies. The CPE that third party vendors make for use on PrimeCo's network operates such that messages sent over PrimeCo's network by a TTY device often arrive at their destination in an unreadable form because of the high character error rate ("CER"). This CER is not the result of the message's transmission over PrimeCo's network; rather, it results from the inability of the customer's CPE to transmit the Baudot tones faithfully.

It is critical that the Commission acknowledge that PrimeCo and other CMRS providers are carriers, and not manufacturers of telecommunications equipment. PrimeCo is dependent upon unaffiliated companies for its network infrastructure and for the terminal equipment it makes available to customers. Hence, while PrimeCo can request certain features or enhancements from its vendors, it is unable to control the development of these features or the rate at which the project proceeds. Moreover, no TTY device now exists that will operate reliably on PrimeCo's digital network. These two points alone underscore that compliance with Section 20.18(c) is not readily achievable.

The situation facing the Commission and carriers is not the result of industry intransigence. Rather, the problem derives from the current incompatibility of two factors: (1) the rapid deployment of digital wireless technologies; and (2) the Commission's policy objective of ensuring that users of existing incompatible TTY technologies have the ability to use new and evolving digital features. As digital carriers deployed their networks to meet buildout requirements and customer demand, Commission, industry and consumer groups have focused time and resources on developing

backward-compatibility solutions for TTY/digital capability. This task has proven difficult and complex to achieve.

A. From the Outset of the E-911 Proceeding There has Been Considerable Uncertainty As to the Scope of Carriers' TTY Obligations and Whether TTY Is Compatible With Wireless Digital Technologies

In the *Second Report and Order* in the Commission's proceeding adopting rules for broadband PCS services, the Commission expressed concern for the availability of E911 capabilities in new broadband PCS systems and announced its intention "to address E-911 and related issues with regard to PCS, cellular, and any other relevant mobile service."⁴ In the *Notice of Proposed Rulemaking* initiating that proceeding, the Commission noted at the time that:

[The record was] *not clear* . . . what Commission rules or policies would be *necessary or appropriate* to ensure access to 911 services for TTY-like devices beyond *the general requirement* that services be compatible with such devices.⁵

The Commission further sought "comment on how to ensure access to 911 services by TTY-type devices that use wireless services, and request[ed] comment on the specific additional features, costs and feasibility issues that may be relevant to achieving

⁴ *PCS Second Report and Order*, 8 FCC Rcd. 7700, 7756 (1993).

⁵ *E911 Notice of Proposed Rulemaking*, 9 FCC Rcd. 6170, 6180 (1994) (emphasis added). The Joint Paper filed by PCIA and emergency service organizations on which the *NPRM* proposal was based, stated that "[t]he wireless system should allow disabled individuals to access emergency services through means [like TDD-capable devices] but this does not impose a requirement that all wireless devices be TDD-capable." *Id.* at 6194.

compatibility.”⁶ In short, there was considerable uncertainty as to the obstacles to TTY wireless digital access at the outset of the proceeding.

In its *E911 First Report and Order*, the Commission adopted Section 20.18(c) which sets forth a *general* requirement that cellular, broadband PCS and certain wide-area SMR providers “be capable of transmitting 911 calls from individuals with speech or hearing disabilities through means other than mobile radio handsets, e.g., through the use of Text Telephone Devices (TTY).”⁷ In that *Order*, the Commission acknowledged concerns raised that “CDMA vendors have been unable to pass through Baudot frequency signaling without distortion,” that implementing TTY access will require “coordination among many parties, including telecommunications and equipment manufacturing industries, the LECs and the PSAPs,” and that “the establishment of a *common data standard* under which wireless and wireline providers can deliver TTY data to the PSAP is the most important coordination issue for this requirement.”⁸ Moreover, the Commission expressly *rejected* the requests that the Commission adopt specific TTY access standards, including “direct connect capabilities for TTY access” and instead deferred such issues to the Commission’s Section 255 implementation proceeding.⁹

⁶ *Id.* at 6180.

⁷ 47 C.F.R. § 20.18(c).

⁸ *E911 First Report and Order*, 11 FCC Rcd. 18676, 18700-01 (1996) (emphasis added).

⁹ *Id.* at 18702. The Commission’s Section 255 proceeding remains pending. *Implementation of Section 255 of the Telecommunications Act of 1996, Access to Telecommunications Services, Telecommunications Equipment, and Customer Premises Equipment by Persons with Disabilities, Notice of Proposed*

(continued...)

Thus, potential difficulties were brought to the Commission's attention early on but were not resolved.

The Telecommunications Industry Association ("TIA") petitioned for reconsideration of the rule, explaining that carriers could not bring digital CMRS systems into compliance because "the vocoders used in digital mobile systems do not reproduce well the signaling tones used by TTYs."¹⁰ TIA thus recommended "flexibility in [Commission] regulations to implement TTY/digital wireless E911 compatibility" and deferral of the rule "until *after standards have been developed* and a reasonable implementation timeframe can be discerned."¹¹ PCIA similarly noted that different standards would be needed for digital networks "because digital networks, unlike analog networks, distinguish between voice and data transmissions in order to implement such features as error detection and correction."¹² While the Commission in the *PCS Reconsideration Order* declined to defer the digital TTY requirement until standards were developed, it

⁹ (...continued)
Rulemaking, WT Docket No. 96-198, FCC 98-55 (rel. April 20, 1998) ("*Section 255 NPRM*").

¹⁰ Telecommunications Industry Ass'n, Petition for Reconsideration, filed Sept. 3, 1996, at iii, 12-15; *E911 Reconsideration Order*, 12 FCC Rcd. 22665, 22688 (1997) ("*E911 Reconsideration Order*").

¹¹ *E911 Reconsideration Order* at 22688.

¹² PCIA Petition for Reconsideration, filed September 3, 1996, at 10-11; *Reconsideration Order*, 12 FCC Rcd. at 22688.

acknowledged the “technical barriers and compatibility problems involved in implementing solutions for TTY users on digital wireless systems.”¹³

Furthermore, the issue of carriers’ TTY/911 obligations remains subject to Section 255. While the Section 255 rulemaking proceeding remains pending, many of the issues under consideration there directly implicate carriers’ TTY/911 obligations. Lastly, also complicating the matter are the Commission’s actions since the *E911 Reconsideration Order*. While the Commission has acknowledged the continued technical obstacles of achieving digital TTY capability, it has continued to push for a backward compatibility solution and has elevated the importance of the so-called “consumer concerns” discussed in the *September 30 Order*.¹⁴ These developments have created further uncertainty as to carriers’ digital TTY/911 obligations.

B. The Commission Did Not Mandate A Particular Digital Protocol and Promoted and Facilitated Rapid Digital Broadband PCS Deployment

The Commission’s TTY/911 rules were not adopted in a regulatory void. Rather, Section 20.18(c) was considered and adopted concurrently with other rules and policies that the Commission must acknowledge in order to understand the enormous complexity of the task facing industry today.

¹³ *E911 Reconsideration Order*, 12 FCC Rcd. at 22695.

¹⁴ *November 30 Order* ¶¶ 7, 11; Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems Order, CC Docket No. 94-102, DA 98-1982, ¶¶ 8-9 (WTB rel. September 30, 1998) (*September 30 Order*); CTIA/PCIA Joint Comments in CC Docket No. 94-102, filed October 30, 1998, at 2 (“Joint Comments”); Letter from Thomas E. Wheeler, President/CEO, Cellular Telecommunications Industry Ass’n, to Chairman Kennard, dated October 28, 1998, at 2 (“Wheeler Letter”).

1. The Commission Has Tacitly Encouraged and Expressly Facilitated the Digitalization of Wireless Technologies While TTY Technologies Have Remained Unchanged

The Commission decided to initiate a proceeding to determine wireless carriers' 911 obligations concurrently with its adoption of policies regarding broadband PCS technical standards. In the *PCS Second Report and Order*, the Commission expressly declined to adopt a single digital technology.¹⁵ Indeed, as the Commission itself noted in the E911 proceeding, “[w]e have decided that the marketplace should determine which digital protocols will survive, and we do not intend to reach different conclusions in this proceeding.”¹⁶ The Commission has designed its rules governing CMRS services to *encourage and facilitate* the development of digital technologies, and digital wireless technologies continue to evolve rapidly.¹⁷

¹⁵ *PCS Second Report and Order*, 8 FCC Rcd. at 7755-56; *see Third CMRS Competition Report*, FCC 98-91 (rel. June 11, 1998) at 33 (“*Third CMRS Competition Report*”).

¹⁶ *E911 First Report and Order*, 11 FCC Rcd. at 18747.

¹⁷ *See PCS Second Report and Order*, 8 FCC Rcd. at 7747; *Pittencrieff Communications, Inc.*, 10 Comm. Reg. (P&F) 430, 430 ¶ 2 (WTB 1997) (merger in public interest in part because it will enable Nextel to perform digital system upgrades that increase capacity and permit expanded services); *Amendment of Parts 20 and 24 of the Commission's Rules — Broadband PCS Competitive bidding and the CMRS Spectrum Cap, Report and Order*, 11 FCC Rcd. 7824, ¶ 103 (1996) (noting that cellular carriers have been “rapidly implementing digital and other new technologies with their current 25 MHz of spectrum and that even analog cellular systems are increasing subscribership and providing enhanced services”); *Implementation of Sections 3(n) and 332 of the Communications Act, Second Report and Order*, 9 FCC Rcd. 1411, 1471 (1994).

The Baudot technologies used in TTY devices, however, have remained fundamentally unchanged for decades.¹⁸ In turn, and as the Forum has demonstrated in its quarterly reports, the disparities between digital and analog technologies have not, to date, permitted development of a “quick fix” solution.¹⁹

2. Broadband PCS Licenses Were Auctioned and Licensees Began Deploying Networks Before Digital TTY Solutions Were Feasible

The Commission completed its auction of A/B Block broadband PCS licensees in March 1995, and the remaining licenses were auctioned through 1996. Consistent with Congress’ intent and Commission rules, broadband PCS carriers have deployed their networks subject to buildout requirements and in compliance with existing technical standards.²⁰ They spent billions of dollars at auction for their licenses, and billions more deploying their networks. PrimeCo itself launched PCS service in late 1996 — around the same time that the Commission’s *E911 First Report and Order* and the general TTY obligations were adopted. As the Commission has acknowledged, consumers have benefited enormously from the competition broadband PCS providers have brought to the CMRS marketplace.²¹

¹⁸ In this regard, the Commission itself has long recognized the drawbacks of TTY technologies. *Communications Services for the Deaf and Hearing-Impaired*, 67 FCC 2d 1602, 1603 (1978).

¹⁹ See TTY Forum Quarterly Status Report, filed October 14, 1998 in CC Docket No. 94-102, at 3; Joint Comments at 4-7.

²⁰ See 47 U.S.C. § 309(j)(3)-(4); 47 C.F.R. § 24.203.

²¹ *Third CMRS Competition Report* at 14-22.

Behind the scenes, of course, carriers were in the process of purchasing, testing, and deploying equipment and handsets. Thus, a sizeable embedded base of CPE and equipment has been deployed — again, consistent with Commission and statutory objectives — using technologies and digital protocols fundamentally at odds with existing TTY devices. Out of necessity, these activities occurred long before *any* standard for digital TTY was under consideration by industry standards bodies. Furthermore, carrier, vendors and standards bodies have also had to grapple with other controversial, technically difficult and time-sensitive regulatory and technical obligations — all with the Year 2000 problem looming ahead.

C. No Manufacturer of Wireless Digital Handsets Currently Has A Commercially Available Product That Will Enable Carriers to Comply With Section 20.18(c)

As discussed above, the record long before adoption of the *E911 Reconsideration Order* indicated (1) that TTY compatibility over digital networks would be extremely difficult, and (2) carriers would deploy available digital wireless technologies notwithstanding the absence of commercially available digital TTY solutions. Nevertheless, manufacturers and CMRS carriers — themselves and through industry groups — have worked in good faith throughout this period to contribute to the Forum's efforts to develop a short-term solution. The TTY Forum has formally met 8 times since September 1997, and sub-groups, such as the CDMA Development Group ("CDG"), GSM North America and Universal Wireless Communications Consortium, have conducted testing and engaged in formal and informal deliberations throughout that

period. Based on currently available information and analysis, PrimeCo believes that some solutions hold promise.

In part at the urging of Commission staff and consumer group participants in the Forum, however, and in light of the impending October 1998 deadline, the Forum decided to focus its efforts on short-term, backward compatibility solutions.²² By mid-1998, however, it became evident that for CDMA carriers a voice-based solution would be simply untenable in the near term, and that efforts should be considered to gauge the feasibility of developing and implementing a so-called "data-based" solution.²³

Nevertheless, in part at the urging of Commission staff and consumer representatives on the Forum, CDMA-based carriers and manufacturers, through the Forum and CDG, continued to study the possibility of implementing a short-term solution. While the CDG subsequently adopted a short-term character error rate ("CER") objective of 3 percent, testing recently conducted by Sprint PCS based on the CDG's TTY Test Procedure results in a CER ranging from 10-15 percent.²⁴ PrimeCo believes that Sprint's results are consistent with the performance of PrimeCo's network. For these

²² See Wireless TTY Forum, Quarterly Status Report, April 10, 1998, Introduction at 3, ¶ I.B; *see also* CTIA Letter at 2.

²³ For example, testing conducted by PrimeCo's vendor Lucent Technologies in May 1998 indicated a character error rate for its CDMA equipment approaching 9 percent. *See* TTY Forum Quarterly Status Report, filed July 10, 1998 in CC Docket No. 94-102. As discussed herein, despite the possible potential feasibility of data-based solutions, certain carriers, including PrimeCo, do not currently deploy digital data.

²⁴ Sprint PCS, TTY Over CDMA Laboratory and Field Test Results, Nov. 19, 1998.

reasons, the industry's conclusion set forth in the October 1998 Quarterly Status Report is equally applicable to all CDMA carriers today, including PrimeCo:

[T]here does not appear to be a voice-based solution in the near future which will allow the Baudot signal of a TTY device to pass through the vocoder of a digital air interface and achieve a character error rate comparable to the character error rate achieved with analog air interface, i.e., less than 1%.²⁵

As the Commission has itself acknowledged, "users of TTY devices will not be able to operate such devices in conjunction with digital phones at any time in the near future."²⁶

With the benefit of 20-20 hindsight, it may be that industry — and the Commission, for that matter — underestimated the complexity of the task before it. Nevertheless, it is clear that in pushing for a short-term, backward-compatibility TTY solution, the Forum and the Commission took a risk in assuming that such a solution would, in fact, be technologically feasible. The Commission must now recognize that there is no readily achievable quick fix to digital/TTY compatibility and, indeed, the problem is exacerbated by the "consumer" requirements that the Commission and others now desire as a part of digital TTY capability. Meeting these requirements while overcoming the fundamental technical problem requires research, development and testing before reliable, affordable devices can be produced.

The Commission should thus build upon what the Forum has learned and should promote the development of long-term (and, if possible, readily achievable short-

²⁵ TTY Forum Quarterly Report, submitted October 14, 1998, at 3.

²⁶ *November 13 Order* ¶ 7.

term) solutions.²⁷ Waiver of Section 20.18(c) for digital carriers for a period sufficient to allow their vendors to develop such solutions is an essential component of this approach.

II. WAIVER SHOWING

A. Steps to Provide Users of TTY Devices With the Capability to Operate Such Devices In Conjunction With Digital Wireless Phones

PrimeCo is taking substantive steps toward providing users of TTY devices with the capability to operate such devices in conjunction with digital wireless phones. In the immediate term, PrimeCo will continue to notify customers that TTY devices cannot be used over a digital network and will notify potential and existing customers when it will have a solution available.²⁸ As demonstrated herein, however, this task is extremely complicated due to CDMA technology and, moreover, many of the short-term solutions previously reported to the Commission are simply infeasible for digital CDMA carriers. One interim alternative would be to enable a TTY user to use a PrimeCo dual mode handset (with appropriate handset software modifications and a TTY

²⁷ Indeed, the Access Board has recognized that as “technology is constantly changing,” Section 255 should not be interpreted “to require obsolete or unmarketable products to be maintained beyond their useful life.” The Board therefore determined that Section 255 “does not require that a new product be both accessible *and* compatible” and that “a change which increased accessibility but decreased compatibility would not be prohibited.” *Access Board Guidelines*, 63 Fed. Reg. 5608, 5620 (Feb. 3, 1998) (emphasis added) (*see discussion infra*).

²⁸ PrimeCo has already notified its existing customers that its digital network is not compatible with TTY/TDD devices. The following message — “*A SPECIAL NOTE TO THE SPEECH OR HEARING IMPAIRED: DIGITAL NETWORKS SUCH AS PRIMECO’S CURRENTLY ARE NOT COMPATIBLE WITH TEXT TELEPHONE DEVICES (TTY/TDD)*” — appears on the first billing statement for all new customers as well as marketing collateral such as product boxes, instruction booklets, and customer newsletters.

interface cable) to find analog AMPS service when an 911 call is placed. While PrimeCo could probably implement this method by late 2Q99, this solution does not facilitate TTY compatibility on PrimeCo's digital network with a CER acceptable to Forum consumer representatives.

As is typically the case in the standards and product development process, industry's efforts to develop and study possible digital TTY solutions have been undertaken by manufacturers, carriers' trade associations such as CTIA and PCIA, and technology-specific groups such as the CDG. Furthermore, PrimeCo is wholly dependent on the availability of equipment and software from its primary vendors to comply with Section 20.18(c) and to obtain the information necessary to provide the information requested in the *November 13 Order*.²⁹ Subject to these limitations, PrimeCo has attempted to make some preliminary determinations as to which of the various solutions currently before the Commission may be feasible for PrimeCo's network and, if feasible, the steps that will be necessary to implement the solution. PrimeCo has also participated in PCIA/CTIA efforts to respond to the Commission's *September 30 Order*.³⁰

As a preliminary matter, PrimeCo personnel have confirmed that the problems associated with carrying TTY calls over digital networks identified by the Forum apply to PrimeCo's network, and that the voice-based solutions discussed by the

²⁹ The Commission on numerous occasions has acknowledged carriers' reliance on vendors for compliant equipment and software and granted waivers of the applicable rules where such equipment and software is unavailable. *See Roosevelt County Rural Tel. Coop., Inc., et al.*, 13 FCC Rcd. 22, 42 (CCB 1997).

³⁰ *See* Joint Comments at App. A.

Forum are infeasible for PrimeCo's network. As discussed below, PrimeCo's engineering personnel are also evaluating the feasibility of implementing the various data solutions currently under consideration at the TTY Forum — although this may not be a solution for PrimeCo. PrimeCo has formally inquired from its vendors as to the availability of potential solutions and the necessary steps for implementing such solutions and is continuing its review of information received. PrimeCo also supports and participates in the efforts of the CDG and TTY Forum.

1. Problems with CDMA Generally

As CTIA and PCIA have reported to the Commission, the primary cause for incompatibility between TTY devices and CDMA systems is the Frame Erasure Rate ("FER") of CDMA systems when using voice service.³¹ The FER is established in order to maintain the minimum power requirement allowing an economical balance between capacity and voice quality for voice services. The FER, like a "Bit Error Rate" for TDMA and GSM networks, is a measure of the quality of the radio channel which, in turn, is a function of the transmitter, propagation characteristics/morphology of the terrain, and the receiver.

Assumptions about FER are the basis upon which all CDMA hardware and software is designed and built, and CDMA systems are precisely tuned to operate at an FER of 1 percent. Due to the slow nature of the TTY Baudot signals (180 ms) compared to CDMA frames (20 ms), a 1 percent FER translates into approximately a 7-9

³¹ *Id.*

percent CER.³² PrimeCo's vendor, Lucent Technologies, demonstrated this clearly at TTY Forum 5 and the Forum reported this to the Commission on July 10, 1998. As a CDMA carrier, PrimeCo has confirmed internally that CDG's findings with respect to the feasibility of various digital TTY solutions would be applicable to its network.³³

Using PrimeCo's existing network and handsets, changing the FER to improve the CER to a level comparable to analog systems would require a significant increase in minimum FER in both the forward (*i.e.* network-to-mobile) and reverse (*i.e.* mobile-to-network). This would significantly reduce network capacity such that PrimeCo's network would drop a number of users and/or seriously degrade the quality of voice services. As such, adjusting the FER to accommodate voice-based solutions does not appear to be an acceptable prospective solution.

2. Voice-Based Solutions Are Currently Infeasible

PrimeCo believes that voice-based solutions, whereby the Baudot signal passes through the vocoder, are generally infeasible for its CDMA network because of the requirement in CDMA to maintain minimum power on both the forward and reverse radio links and the resulting high CER, as discussed above.³⁴ Furthermore, PrimeCo

³² One TTY character spans 9 CDMA voice frames.

³³ See Attachment A, Declaration of Roger Sampson.

³⁴ PrimeCo vendor Qualcomm has confirmed that these solutions, which generally require direct transmission of Baudot tones over voice sessions, result either in unacceptable CER or would require silicon changes in the Mobile Station Modem ("MSM"). Qualcomm has further indicated that the MSM design modifications necessary for Baudot over voice channel implementation would require one and one-half to two years to deploy and would adversely affect existing products due to added CPU usage, added power consumption and increased complexity while
(continued...)

understands that none of these short-term solutions currently provide for reliable service in a mobile environment — thus defeating the purpose of imposing a TTY requirement on “commercial *mobile* service” providers. Notwithstanding this assessment, recent information from Lucent concerning a proposed receiver/repeater solution appears to hold promise. Again, while this is a solution dependent on vendor action, PrimeCo is evaluating the feasibility of this option.³⁵

- ***Direct Audio Connection.*** At this time, only one of PrimeCo’s handsets, the Nokia 2170, currently provides a 2.5 mm jack for direct audio connection. The Sprint PCS laboratory testing, discussed above, revealed that this option results in a CER ranging from 10-15%. Input levels will be different for each make and model handset, and a special adapter would be needed — and audio input and output levels defined — to achieve standard levels. PrimeCo thus agrees with the Forum that this solution is not a viable short-term solution and is not currently pursuing this proposed solution.

- ***Acoustic Solution.*** PrimeCo agrees with the Forum that this solution is not a viable short-term solution. PrimeCo will continue to evaluate this option, but testing to date has already yielded a CER of 10-15%. PrimeCo is therefore not currently pursuing this proposed solution.

³⁴ (...continued)
offering less reliability under drive conditions.

³⁵ See discussion *infra*.

- ***RJ-11-Type Modular Connection/Jack and True RJ-11 Connection.*** PrimeCo agrees with the Forum that this is not a viable short-term solution. The modular connection is an analog solution that is inapplicable to PrimeCo's digital network and this approach does not improve the CER for CDMA carriers. PrimeCo intends to test an RJ-11 connection with one of its handsets, but still anticipates a CER of 10-15%. PrimeCo therefore does not currently believe this will be a viable option.

- ***Proprietary Solutions.*** By definition, other carriers' proprietary solutions are not available to PrimeCo to evaluate and test. PrimeCo will evaluate the feasibility of such solutions as they become available. PrimeCo has tested a TTY device with the Qualcomm QCT-6200 Wireless Centrex phone, which looks similar to a base station from a traditional home cordless telephone and is meant to operate as a wireless office phone. PrimeCo believes that this may present a possible viable short-term solution, as the phone has a battery backup of 3-6 hours and is therefore portable. Preliminary testing via an acoustic coupler and a TTY device manufactured by Ultratec resulted in a CER similar to other CDMA voice-based testing, but PrimeCo believes it is possible that an RJ-11 connection may have a lower CER. This approach would have minimal impact to PrimeCo's network and, is dependent on further testing to determine feasibility. Preliminary indications suggest that this proposal would entail estimated costs of nearly one thousand dollars per phone.

PrimeCo has also examined whether minimal modifications in the FER are feasible as a possible solution. A number of factors indicate that this is not viable. Equipment is currently not able to provide reliable service at an FER of less than 1%, as

doing so would result in an increase in call blocking and a loss of network capacity — thus potentially resulting in blocking other 911 callers. Also, handsets need to operate at approximately 8-10 dB better than the average handset, which would not be readily achievable for most handset vendors at this time. Thus, PrimeCo is not likely to pursue this approach.

- ***Receiver/Repeater Solution.*** The receiver-repeater solution proposed by Lucent appears to hold promise at present and, if feasible, would likely enable customers to use voice-based solutions discussed above. This solution would require modifications to the mobile terminal only, involving combining adaptive transmitter power control for the reverse link and a receiver/repeater algorithm for the forward link. Lucent has reported to TIA that this would result in a CER of below 1%. According to Lucent, there would be no need for special terminals or equipment other than minor modifications to the vocoder firmware and the physical connection to the phone; the solution would be interoperable with unmodified CDMA standards using existing technical standards; and it would enable TTY calls to be made transparently, even when made in-band from a land-based TTY device to the mobile.

PrimeCo understands, however, that this solution will require modifications to PrimeCo's network. It will also be necessary to find a mobile manufacturer that will agree to implement the receiver/repeater on a terminal. It is our understanding that Lucent has had encouraging discussions with at least one vendor. This solution would also require additional testing and an analysis has not been produced by the TTY Forum, to date. Furthermore, the availability of this approach is almost entirely dependent on

handset vendors. Again, preliminary indications are that this is a possible solution which should continue to be pursued.

3. Long-Term Data-Based Solutions

PrimeCo has reviewed the data-based solutions currently before the Commission. The record reflects the technical problems and timing issues associated with the various data proposals. For its part, PrimeCo advises the Commission that it currently does not have wireless data capability. Accordingly, PrimeCo submits that it is questionable whether these solutions are readily achievable, as required under Section 255. Nevertheless, while neither relevant nor feasible in its current operations, PrimeCo below discusses its understanding of the proposed data-based solutions to ensure that it is responsive to the Commission's *November 13 Order*.

- **v.18 IWF Solution.** This solution involves the use of an Inter-Working Function ("IWF") platform that converts TTY-generated Baudot signals to ASCII and performs other TTY call functions. According to vendors, this will allow the CDMA digital air interface in existing networks to serve TTY devices without major modifications to handsets or TTY devices. PrimeCo understands that this method has been employed in Europe on GSM networks.

There are a number of steps necessary to implement this solution, *in addition to* the deployment of wireless data capability. First, third-party production of modem cards for use in the IWF is necessary. This equipment would need to then be installed, integrated, tested and supported with software upgrades and spare hardware on an ongoing basis. Also, the operational readiness of this equipment would require

modifications to PrimeCo's network monitoring systems, training and possible staffing additions. Furthermore, this solution will require circuit switched data support in all of PrimeCo's networks. In particular, it would require switch and BTS software upgrades for IS-707 circuit switched data support.

Again, PrimeCo does not currently provide data service and the company is currently focused on providing high quality digital voice service. Implementation of this solution would require significant changes to PrimeCo's business plan and significant expenditures, including the upgrade of thousands of cell sites, switch and handset software, as well as significant software licensing fees. Finally, it appears that this functionality will not work if a TTY user roamed into another PCS carrier's network, unless that PCS carrier employs a CDMA network, has implemented the v.18 IWF solution, and allows roaming TTY users access to its IWF for TTY calls. For these reasons, this is not a solution that is readily achievable at this time.

- ***Qualcomm Hybrid Data.*** This solution is similar to the v.18 solution in that it involves an IWF platform that conveys TTY-generated Baudot signals to the PSAP and performs other TTY call support functions. Qualcomm informs PrimeCo that simulations involving transmitting TTY signals as data via its "asynchronous data solution" have resulted in CER approximating those of analog cellular systems. According to Qualcomm, this solution is less susceptible to errors in a mobile environment and leverages existing standards-based connectivity in handsets to provide direct TTY access via a wireless data solution. The viability of this solution depends on factors outside of PrimeCo's control. The caller must use a data-capable TTY or other data-

capable input device. In order for the landline party to receive Baudot, carriers must implement an IWF, which converts the data into a Baudot session and similarly transmits received Baudot-based data to the wireless device via the data session.

Data-enabled TTY-capable peripheral devices will need to be developed by TTY vendors. Qualcomm informs PrimeCo that one vendor is developing data retrofit kits to modify existing TTY devices. Qualcomm cautions that while it anticipates that its handsets will be usable without modification, *further cooperation in developing data-capable TTY devices may reveal unforeseen software requirements for the handset*. In this regard, it is unclear when TTY manufacturers may develop digital standards and solutions for their own products. In addition, while the use of TTY modems as part of asynchronous data services is already specified in IS-707, PrimeCo would need to upgrade its network via software modifications to support TTY modems in the IWF. In this regard, a third party will need to produce this IWF platform. Also, as with the v.18 solution, this solution will require circuit switched data support in all of PrimeCo's networks — which does not currently exist — and thus would entail significant costs. Finally, it is PrimeCo's understanding that a TTY roamer will be subject to the same restrictions as those discussed above for the v.18 solution.

- ***Third Party Gateway.*** This approach entails providing a TTY-911 user with a number to access an IWF operated by a third party. This IWF would then complete the call to a landline TTY. PrimeCo has not explored this in detail and will continue to participate in Forum efforts to evaluate the viability of this option. Timeta-

bles and cost estimates for this option are not presently available. Again, data capability must be present to support this solution and PrimeCo does not have such capability.

B. Tentative Timetables for Potential Solutions

Again, as the Commission is aware, carriers are wholly dependent on vendors to determine when potential solutions may become commercially available. PrimeCo has formally inquired from its vendors information concerning the commercial availability of potential solutions and has incorporated information herein. PrimeCo will continue to provide responsive information on an ongoing basis as to the timing of deployment as such information becomes available.

Obviously, and as the Commission is aware, the implementation process is necessarily time-consuming. Once a standard is adopted, the solution will need to be developed by vendors, and tested and implemented by digital carriers. In this regard, PrimeCo will continue participating with the Forum's testing and related efforts on an ongoing basis and will continue to test the various solutions. Once a solution becomes commercially available (which has not yet occurred), absent unforeseen developments it generally takes 8-12 months to select, install, integrate and test the solution. For these reasons, PrimeCo anticipates that compliance will not be feasible until December 1999/January 2000, *at the earliest*. PrimeCo currently believes that a more realistic date for a commercially available long-term solution is an additional 18-24 months, and that a short-term solution may be available not earlier than 2Q99.

- **v.18 IWF Solution.** If and when this solution is deemed to be viable and if it were to be made commercially available, the tentative timetable for

implementing the feature would be approximately 8-12 months. This timetable accounts for the comparison and selection of IWF and v.18 modem card vendors, the selection of suitable locations for and installation of the IWF, and the integration and testing of the IWF in PrimeCo's network. Vendor 3Com has informed PrimeCo that it intends to develop this feature on its IWF and will provide tentative delivery dates as soon as possible.

- ***Qualcomm Hybrid Data.*** Qualcomm has stated that it presently intends to roll out data in some existing handsets in December 1998 or January 1999, and in others during the first half of 1999. For carriers who opt to use Qualcomm's solution, the timing of availability to consumers will depend on infrastructure upgrades and data-enabled TTY availability. PrimeCo is evaluating the feasibility of Qualcomm's solution. If this solution is determined to be viable for PrimeCo's network and, if the solution becomes commercially available, the tentative timetable for implementing the feature would be approximately 8-12 months thereafter. This timetable accounts for the comparison and selection of IWF and v.18 modem card vendors, the selection of suitable locations for and installation of the IWF, and the integration and testing of the IWF in PrimeCo's network. Again, it is too soon to determine if the Qualcomm solution will be appropriate for PrimeCo.

- ***Proprietary Solutions.*** If the short-term Wireless Centrex solution results in a CER of 4-8%, PrimeCo may offer this product by 2Q99 to TTY users. Again, it is too soon to determine whether this is a genuinely viable solution.

- ***Receiver/Repeater Solution.*** Lucent informs PrimeCo that simulated tests will be conducted through 1998, and the simulation may be implemented by June 1999. Prior to commercial availability, however, Lucent and the mobile vendor must arrive at a business agreement for the solution, and must undertake to implement the solution in products for market. Until then, Lucent indicates that a delivery/availability date for this solution cannot be estimated.

C. Steps to Address “Consumer Concerns”

In the *September 30 Order*, the Bureau required that the Forum finalize the “draft workplan” for its future activities and further provided that “approval of the workplan must be obtained *from all groups* participating in the Forum.”³⁶ The Bureau stated that:

We note, in this regard, that it will be necessary for the workplan to address consumer concerns. For example, consumer representatives recently provided to the Forum member groups a list of criteria that the consumer representatives *would like to be incorporated* into any solutions implemented by the Forum.³⁷

Attached to the *September 30 Order* was the memorandum submitted to the Forum by its consumer representatives, listing thirteen desired “functional characteristics” to be incorporated into TTY solutions.³⁸

In the *September 30 Order*, the Commission simply observed that consumer representatives on the Forum had submitted these concerns to industry

³⁶ *September 30 Order* ¶ 9.

³⁷ *Id.* ¶¶ 8-9 (emphasis added).

³⁸ *Id.* App. A.

representatives. In the *November 13 Order*, however, the Commission appears to have elevated the importance of these concerns, determining that for a carrier “to demonstrate [its] commitment to, and plans for, complying with Section 20.18(c)” it must “specify with sufficient particularity” the “reasonable steps the carrier will take to address the consumer concerns referenced in the *September 30 Order*.”³⁹

PrimeCo is uncertain whether the Bureau has attempted to now elevate the so-called “consumer concerns” into *de facto* regulatory obligations or technical standards and it hereby reserves the right to challenge such action. In this regard, PrimeCo notes that: (1) the Commission has *not* put the consumer concerns on public notice; (2) has *not* amended Section 20.18(c) to incorporate the consumer concerns into the rules; and (3) the feasibility of incorporating the consumer concerns are currently issues before the Forum and appropriate industry standards bodies. PrimeCo therefore presumes that the Bureau has incorporated the consumer concerns into this proceeding for solely informational purposes. Thus, pursuant to the *November 13 Order*, PrimeCo below discusses the extent to which possible TTY solutions address the consumer concerns.

As the Commission is aware from the most recent Forum report, industry has determined that the various voice- and data-based solutions support the consumer concerns in varying degrees.⁴⁰ As discussed above, PrimeCo has determined that the various voice-based solutions are not feasible for PrimeCo’s network. It appears that the proposals which may be feasible for PrimeCo’s network support most of the consumer

³⁹ *November 13 Order*, ¶¶ 10-11.

⁴⁰ *See* TTY Forum Workplan at 11-17.

concerns; PrimeCo cautions, however, that additional testing will be required to confirm the extent to which the consumer concerns will be supported.⁴¹ In addition, the availability of enhanced 911 features such as ALI and ANI will depend on whether PSAPs have the capability to receive such calls — a matter over which carriers have no control.

- ***v.18 IWF Solution.*** It is PrimeCo's understanding that this method may meet all so-called consumer concerns except # 9 — Voice Carryover (VCO) during a 911 call. The feasibility of adding this feature has yet to be determined. PrimeCo will report on the feasibility of adding this feature in later updates as such information becomes available.

- ***Qualcomm Hybrid Data.*** It is PrimeCo's understanding that this method may also meet all consumer concerns except # 9 — Voice Carryover (VCO) during a 911 call. The feasibility of adding this feature has yet to be determined. PrimeCo will report the feasibility of adding this feature in later updates as such information becomes available.

- ***Receiver/Repeater Solution.*** To date, PrimeCo has been unable to effectively evaluate how well this approach would address the consumer requirements, and the Forum has yet to produce such an analysis. However, there are preliminary indications that it may support all of the thirteen criteria.

- ***Proprietary Solutions.*** Regarding the Wireless Centrex phone, while CER may be improved, PrimeCo does not expect a CER of less than 1%. To date,

⁴¹ *See id.*

PrimeCo has been unable to effectively evaluate how well this approach would address the consumer requirements, and the Forum has yet to produce such an analysis.

Regarding the FER adjustment option, most consumer concerns would reportedly be addressed. However testing is needed to determine whether the CER can be reduced; whether visual monitoring of all aspects of the call is feasible; VCO/HCO support; whether older TTYs can be supported; and whether drive conditions can be supported.

- **Third Party Gateway.** It is PrimeCo's understanding that this solution may meet most, but not all, criteria. Importantly, it is undetermined whether a CER of less than 1% can be achieved; whether VCO and HCO can be supported; and whether drive conditions can be supported. It is also PrimeCo's understanding that ANI and ALI cannot be passed, and that a TTY user cannot visually monitor all aspects of a call.

III. COMPLIANCE WITH SECTION 20.18(C) IS NOT CURRENTLY READILY ACHIEVABLE FOR DIGITAL CMRS PROVIDERS

Throughout the proceeding, the Commission has relied on the Americans with Disabilities Act ("ADA") as a principal basis for its wireless TTY requirement.⁴² Section 255 of the Act — on which the Commission also relies — further clarifies wireless carriers' obligations regarding access to the disabled.⁴³ Importantly, both the

⁴² See *E911 Reconsideration Order* at 22,686; *E911 First Report and Order*, 11 FCC Rcd. at 18,699; *E911 NPRM*, 9 FCC Rcd. at 6180, n.55.

⁴³ See *E911 Reconsideration Order* at 22,687; *E911 First Report and Order*, 11
(continued...)

ADA and Section 255 impose limits on what the Commission can require of carriers. Section 255 provides that “[a] provider of telecommunications service shall ensure that the service is accessible to and usable by individuals with disabilities, *if readily achievable*.”⁴⁴ A provider must also “ensure that [its] service is compatible with *existing peripheral devices or specialized customer premises equipment commonly used by individuals with disabilities* to achieve access, *if readily achievable*.”⁴⁵ “Readily achievable,” in turn, is the ADA’s definition of that term as “easily accomplishable and able to be carried out without much difficulty or expense” taking into account factors relating to the nature and cost of the action.⁴⁶

The Access Board has already determined that specialized customer premises equipment includes certain TTY devices.⁴⁷ The Access Board has further determined that its guidelines are “‘prospective in nature’, intended to apply to future products.”⁴⁸ Indeed, the Commission itself has echoed that sentiment, tentatively concluding that:

[O]nce a product is introduced in the market without accessibility features that were not readily achievable at the time, Section 255

⁴³ (...continued)
FCC Rcd. at 18,699.

⁴⁴ 47 U.S.C. § 255(c) (emphasis added).

⁴⁵ 47 U.S.C. § 255(d) (emphasis added).

⁴⁶ See 42 U.S.C. § 12181(9), 47 U.S.C. § 255(a)(2).

⁴⁷ 63 Fed. Reg. at 5615-16.

⁴⁸ 63 Fed. Reg. at 5612.

*does not require that the product be modified to incorporate subsequent, readily achievable access features.*⁴⁹

As discussed herein, compliance with the TTY obligation is not readily achievable and the Commission may not require PrimeCo to have such capability until it is readily achievable.

The Commission has proposed a three-step inquiry for determining “whether a particular telecommunications access feature” is “readily achievable: (1) is the feature feasible? (2) if so, what would be the expense of providing the feature? and (3) given its expense, is the feature practical? By this standard, and any reasonable interpretation of Section 255, digital/TTY compatibility is not readily achievable by January 1, 1999, and will not be readily achievable for a considerable period of time. Moreover, backward compatibility may not be readily achievable at all, and data-based solutions may also not be readily achievable for certain carriers.

As demonstrated above, it is technologically infeasible to provide TTY access to digital wireless technologies at this time and, as the Commission has tentatively determined in the 255 proceeding, technological or physical infeasibility are “various reasons why a particular feature might not be feasible.”⁵⁰ While TTY/digital compatibility may be feasible at some future date, the record demonstrates that it is not technologically feasible now to implement such capability. Furthermore, implementation of a data-based solution will be an expensive undertaking. While some carriers have announced

⁴⁹ Section 255 NPRM ¶ 120 (emphasis added); *see also Access Board Guidelines*, 63 Fed. Reg. at 5612.

⁵⁰ Section 255 NPRM ¶¶ 101-102.

plans to deploy data wireless capabilities, whether they do so must remain a business decision rather than a regulatory obligation. Upgrading PrimeCo's network to accommodate digital/911 compatibility requires the capability to carry any TTY call — not just 911 calls. To do so on a long-term basis further requires implementation of data wireless capabilities which, in turn, may involve an entire reconfiguration of the company's business plans.

In light of these factors — technical infeasibility and cost — TTY digital compatibility is not practical at this time. In this regard, the Commission has proposed a number of factors to consider in determining practicality, many of which are applicable here.⁵¹ First, as a competitive carrier, PrimeCo has limited financial resources, and some of the costs of implementing accessibility would invariably have to be passed on to consumers. The costs may be particularly burdensome if carriers are forced to use one particular solution, as the vendor of that solution would have a virtual monopoly on the market. In addition, PrimeCo does not have the laboratory and research facilities necessary to do all the testing necessary to evaluate possible TTY/911 solutions, and must therefore rely heavily on third-parties, such as manufacturers, larger carriers, and its participation in industry associations, for the resources necessary to implement such a solution. Furthermore, as discussed above, PrimeCo's engineering and technical

⁵¹ *Section 255 NPRM* ¶ 106. These factors are: financial, staff, facilities, and other resources available to meet the expenses associated with accessibility; the potential market for the product or service, taking into account the manner and extent to which the service is altered or changed in connection with making it accessible; the degree to which the provider would recover the incremental cost of the accessibility feature; and issues regarding product life cycles.

personnel have a number of competing demands, some of which are Commission-imposed, while others, such as the Year 2000 problem, are no less critical. Finally, telecommunications services, CPE and telecommunications equipment are evolving rapidly, thus making it difficult and, as this issue demonstrates, costly and time-consuming to develop backward compatibility solutions. All of these factors support the conclusion that TTY/digital compatibility is not readily achievable at this time.

IV. PRIMECO HAS SHOWN GOOD CAUSE FOR THE WAIVER

Waiver of the Commission's rules is warranted where special circumstances warrant a deviation from the general rule and such deviation will serve the public interest.⁵² The Commission has, on numerous occasions, determined that the nonavailability of compliant equipment and software from manufacturers constitutes "special circumstances."⁵³ Furthermore, grant of the waiver request will serve the public interest by enabling PrimeCo to continue to evaluate potential solutions and, once a feasible solution become commercially available, to test and implement it. Users of TTY devices may continue to use analog wireless technologies, and PrimeCo will continue to notify consumers of the need to use such technologies until a digital solution is available and implemented.

⁵² See *Northeast Cellular Tel. Co., L.P. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

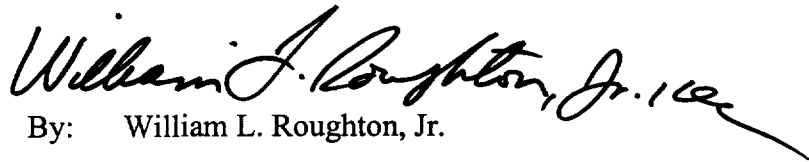
⁵³ See *Roosevelt County Rural Tel. Coop.*, 13 FCC Rcd. at 42; see also 47 C.F.R. § 24.819 (waiver may be warranted where "unique facts and circumstances of a particular case render application of the rule inequitable, unduly burdensome or otherwise contrary to the public interest" and where there is "lack of a reasonable alternative.")

CONCLUSION

For the foregoing reasons, PrimeCo respectfully requests that the Commission grant the instant petition for waiver of Section 20.18(c) until a viable TTY solution is implemented.

Respectfully submitted,

PRIMECO PERSONAL COMMUNICATIONS, L.P.


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Its Attorney

December 4, 1998


DECLARATION/VERIFICATION

I, Roger Sampson, state as follows:

1. I am Director of RF System Engineering and Planning at PrimeCo Personal Communications, L.P. ("PrimeCo") and have been given supervisory responsibility with respect to PrimeCo's TTY Compliance effort.

2. As such, I am familiar with PrimeCo's efforts to comply with Section 20.18(c) of the Federal Communications Commission's rules and with the subject matter of the attached Petition for Waiver.

3. I have read the foregoing Petition for Waiver and the facts and statements contained therein are true and correct to the best of my knowledge, information and belief.


Roger Sampson

Dated: 04 DEC 98